PATENT SPECIFICATION

Application Date: May 6, 1940. No. 8135/40. **541,015**

Complete Specification Left: March 12, 1941.

Complete Specification Accepted: Nov. 10, 1941.

PROVISIONAL SPECIFICATION

Improvements in or relating to the Binding of Books

We, FLEXIBACK MACHINERY COMPANY LIMITED, a British Company, of 132, Westbridge Road, Battersea, London, S.W.11, and LIONEL JOHN BRYANT RUSHENT FRENCH, a subject of the King of Great Britain, of the above Company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to the binding of books and particularly to the process known as "back stripping", the chief object being to evolve a construction of "pleater" for creasing or corrugating the strip or lining prior to its application to the book back, which is an improvement in or modification of the pleater disclosed by the specification and drawings of prior Patent No. 441,294. Such a pleater is used to crease or corrugate the calico or other strip or lining prior to it being glued to the back of the book, the strip during the subsequent rounding and backing operation of the book resuming its original substantially smooth form, the corrugations being flattened out, the corrugated form of the strip permitting of the book being spread during rounding and backing without fear of splitting the lining or disturbing the position of the lining on the back of the book whilst giving the book back a greater degree of flexibility.

The pleater forming the subject of the above numbered Patent consisted of two metal plates having each a series of parallel spaced longitudinally arranged ribs or projections, the plates being arranged face to face so that the ribs on the one plate lay opposite the intervening recesses between the ribs on the other plate, the strip or lining being drawn between the plates so that it became creased or corrugated in a longitudinal direction.

The ribs were arranged in echelon formation, the central rib being the longest and being engaged first by the strip, the strip being creased progressively outwardly during its passage through the pleater. This form of pleater, however, had the disadvantage that the strip was continually being drawn inwards during its passage through the pleater, considerable friction being set up between the ribs and the strip and necessitating the expenditure of considerable energy in dragging the strip through the pleater.

A pleater, constructed in accordance with the present invention, comprises two identical or substantially identical plates, each having a series of spaced longitudinally arranged ribs or projections arranged preferably though not essentially in echelon formation, as hitherto, the ribs, however, converging towards the rear end of the pleater as distinct from being arranged in parallel relationship.

With the improved pleater the strip or lining is progressively creased or corrugated during its passage therethrough, i.e. the depth of the creases is progressively increased as the strip passes through the pleater as a result of the converging arrangement of the ribs. With this arrangement, which is distinct from the prior construction, in which the strip was creased to the full depth immediately it entered the pleater, the friction set up between the plates and strip is very much less, the converging arrangement of the ribs causing the strip to be contracted inwardly to the centre without excessive lateral drag to reduce its overall width progressively as it passes between the plates, the strip being free from all lateral stresses during its passage through the pleater.

The ribs are preferably radiussed at their leading edges to facilitate the passage of the strip therebetween and may be formed by a process of electro-deposition or in any other suuitable way.

The amount of contraction or pleating imparted to the strip may be varied by varying the length of engagement of the pleaters.

If desired, the various ribs may be independently mounted so that their widest end may be adjusted by a suitable mechanism such as, for instance, movable wedges, and their relative angularity increased or decreased thus increasing or decreasing the amount of contraction imparted by the pleats or corrugations.

Dated this 6th day of May, 1940.

HASELTINE, LAKE & CO.,
28, Southampton Buildings,
London, England,
and 19—25, West 44th Street,
New York, U.S.A.,
Agents for the Applicants.

COMPLETE SPECIFICATION

A New or Improved Pleater particularly intended for use in connection with the Binding of Books

We, FLEXIBACK MACHINERY COMPANY LIMITED, a British Company, of 132, Westbridge Road, Battersea, London, S.W.11, and LIONEL JOHN BRYANT RUSHENT FRENCH, a subject of the King of Great Britain, of the above Company's address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The pleater forming the subject of the present application is particularly intended for use in connection with the process known as "back stripping" in book binding, the pleater being employed to crease, pleat or corrugate the strip or lining prior to its application to the book back, the pleater constituting an improvement in or modification of the pleater disclosed by the specification and drawings of prior Patent No. 441,294. The pleater is used to crease or corrugate the calico or other strip or lining prior to it being glued to the back of the book, the strip during the subsequent rounding and backing operation of the book resuming its original substantially smooth form, the corrugations being flattened out, the corrugated form of the strip permitting of the book being spread during rounding and backing without fear of splitting the lining or disturbing the position of the lining on the back of the book whilst giving the book back a greater degree of flexibility.

The pleater forming the subject of the present invention, however, may be used for many other purposes other than in connection with the binding of books and may be satisfactorily used for pleating paper, or other non-metallic material in addition to that usually employed in connection with book binding.

The pleater forming the subject of the above numbered Patent consisted of two metal plates having each a series of parallel spaced longitudinally arranged ribs or projections, the plates being arranged face to face so that the ribs on the one plate lay opposite the intervening recesses between the ribs on the other plate, the strip or lining being drawn between the plates so that it became creased or corrugated in a longitudinal direction.

The ribs were arranged in echelon formation, the central ribs being the longest and being engaged first by the strip, the strip being creased progressively outwardly during its passage through the pleater. This form of pleater, however, had the disadvantage that the strip was continually being drawn inwards during its passage through the pleater, considerable friction being set up between the ribs and the strip and necessitating the expenditure of considerable energy in dragging the strip through the pleater.

A pleater for creasing, pleating or corrugating calico or other non-metallic strip material constructed in accordance with the present invention comprises two plates or members between which the strip to be pleated is adapted to be drawn, each plate having a series longitudinally arranged ribs which project from the plate and are of a uniform or substantially uniform depth throughout their length, the ribs being so arranged that they converge towards the rear of the pleater, i.e. in the direction of travel of the material as it is drawn between the two sets of ribs, the ribs on the one plate entering the spaces between the ribs on the other plate.

The arrangement of the ribs is such that the strip or other material being pleated contacts only with the edges of the ribs, thereby reducing the amount of friction to a minimum, whilst the converging arrangement of the ribs results in the depth of the creases or pleats imparted to the strip being progressively increased as the strip passes through the pleater. In the present construction the echelon formation of the ribs may be retained as this assists in ensuring straight starting of the material.

With this arrangement, which is distinct from the prior construction, in which the strip was creased to the full depth immediately it entered the pleater, the friction set up between the plates and strip is very much less, the strip not contacting the plates themselves, the converg-

ing arrangement of the ribs causing the strip to be contracted inwardly to the centre without excessive lateral drag to reduce its overall width progressively as it passes between the plates, the strip being free from all lateral stresses during its passage through the pleater, friction being confined to an area of the material equal only to the edges of the ribs.

The ribs are preferably radiussed at their leading edges to facilitate the passage of the strip therebetween and may be formed by a process of electro-deposition or in any other suitable way.

It has already been proposed to produce grooved strip metal by drawing the strip between die members which were forced into contact with the strip, and were so shaped that the strip was bent progressively into a corrugated form in cross section as it was drawn between the die members. In this prior construction one die member only was formed with ribs which were of progressively increasing depth from the end at which the strip entered to the exit end, the other die member having correspondingly arranged and shaped recesses to receive the ribs which were likewise of progressively increasing depth from the exit end to the inlet end. The ribs and their associated recesses were arranged to converge in the direction of movement of the strip when drawn between the dies, with the object of increasing the depth of the grooves in the strip progressively. In this prior arrangement, however, the strip made contact with the ribs and the adjacent surfaces of the recesses, and with the adjacent flat parts of the die members and, consequently, considerable friction was caused in drawing the strip therethrough.

In order that the said invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawings, wherein:—

Figures 1 and 2 illustrate in side elevation an adjustable form of pleater constructed in accordance with the invention;

Figure 3 is a plan view of one type of pleating plate employed;

Figures 4, 5, 6 and 7 are sectional views on the lines IV, V, VI and VII in Figure 2 illustrating diagrammatically the manner in which the strip is progressively pleated;

Figure 8 is a perspective view of a proposed form of multiple cam to control the number of ribs in operation;

Figure 9 is an end elevation of the cam illustrated in Figure 8, illustrating a method of operation; and

Figures 10 and 11 illustrate in side elevation and plan view a further form of pleater constructed in accordance with the invention.

The pleater illustrated by Figures 1 and 2 of the accompanying drawings comprises two plates or members 1 and 2, each carrying a set of ribs 3, which are arranged in converging relationship in the manner shown in Figure 3 which illustrates in plan view one of the plates or members carrying a series of such ribs, the ribs on the co-operating plate being so arranged that they enter the spaces between the ribs of the first mentioned plate.

In Figures 1 and 2 the ribs associated with the lower plate 2 are either rigidly located in position within grooves or slots formed in the plate or formed integrally therewith or are adjustable relative to the plate by suitable adjusting means such as, for example, by means of the wedge or wedges 4. The ribs associated with the plate 1 are pivotally connected thereto at the point 5 and the rearward ends of the pleater are formed with upstanding portions 6, which are engaged by a cam or eccentric 7 for the purpose of moving them into a position in which they enter the spaces between the ribs on the adjacent plate to a greater or less extent. If so desired, the engaging cams may be so arranged that any desired number of ribs can be brought into operation, the suggested multiple cam being shown in Figures 8 and 9.

In this arrangement each cam 7*a* is formed with a flat surface 7*b*, the flats on the two endmost cams being identically arranged. The flats on the next two adjacent cams are shorter and occupy a different angular position, the flats on the remaining cams being shorter still and occupying a further angular position as shown in Figure 9. In operation by rotating the cam in the appropriate direction the three centre ribs can first be brought into use. Further rotation will bring into use also the next adjacent ribs, further rotation still bringing all the ribs into operation. It will be appreciated that none of the ribs will be in operation when the cam is in the position shown in Figure 9, the flats permitting of the ribs being moved upwardly as the material to be pleated is passed through the pleater. In Figure 1 the ribs on the upper plate are shown clear of the spaces between the ribs on the lower plate, whilst in Figure 2 under the action of the eccentric 7 the ribs associated with the upper plate have been moved downwardly so that they enter the spaces between the ribs on the lower plate, the depth of entry progressively increasing from the right-hand side of the pleater, that is to say, the forward end,

to the left-hand side of the pleater which constitutes the rearward end.

The material to be pleated enters the pleater in the direction of the arrows, the ribs being radiussed at the points 8 to facilitate the entry of the material therebetween. Figures 4 to 7 illustrate the manner in which the material 9 is progressively creased or pleated during its passage through the pleater, Figure 4 indicating the material in a flat condition as its enters the pleater, whilst in Figures 5, 6 and 7 the material is shown creased to a progressively increased extent, the depth of the creases in the case of Figure 7 being substantially at their maximum as the material is about to leave the rearward end of the pleater. By means of the eccentric adjuster 7 the depth of the creases can be varied to suit any particular requirements or to suit the material being pleated or to compensate for wear of the ribs. If so desired, adjustment of the angle of the ribs may be effected by the use of further wedges which, inserted at the entry end, spring the ribs apart, the latter for this purpose being firmly held for about half an inch at their exit end.

In the case of the pleater illustrated by Figures 10 and 11, the pleater is again formed in two parts but in this case the rearward part 10 is attached to a heater box 11 containing heating elements for the purpose of heating the material during its passage through the pleater, this being particularly desirable when pleating calico or similar material, the part 10 carrying a series of ribs of the maximum number required.

The part 10 carries a bracket 12 carrying an upstanding post 13 upon which the front part 14 of the pleater is pivotally mounted. In this way the parts 10 and 14 can be moved into and out of operative engagement to permit of the initial entry of the material to be pleated therebetween. The table or the like 15 carrying the pleater is provided with upstanding posts 16 to permit of vertical adjustment of the heater box and its associated back part 10 of the pleater. Vertical adjustment is effected by means of the hand wheel 17 which is mounted on the threaded spindle 18 secured to the heater box 11 or its associated part 10.

The part 10 or its associated heater box is provided with a forwardly projecting bracket 19 in which is mounted a spring urged plunger 20 which is adapted to engage an adjustable threaded stud or buffer 21 mounted upon the forward part 14 of the pleater, the plunger 20 being provided with a pin 22 which slides in a slot 23 and which, upon the plunger 20 being withdrawn by the handle 24 against the action of the spring 25, can be moved clear of the slot and into engagement with the extremity of the part 26, thereby maintaining the plunger in its withdrawn position and permitting of the part 14 being turned about its pivot 13 into the position indicated by dotted lines in Figure 11 to permit of the initial insertion of the material to be pleated between the parts of the pleater. The extension 27 of the part 14 is provided with an arm 28 carrying a counter-weight 29 which balances the pleater so that it can align itself when the material is in position between the front and back pleater plates.

The front member 14 of the pleater may carry a ribbed plate having a suitable number of ribs according to the width of pleating required, the plate being readily removable and replaceable by one having a different number of ribs.

It will be readily understood from the foregoing description that with either form of pleater hereinbefore described the material will be pleated or creased without resulting in excessive drag, the depth of the creases imparted to the material being progressively increased as the material passes through the pleater.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A pleater for creasing, pleating or corrugating calico or other non-metallic strip material comprising two plates or members between which the strip to be pleated is adapted to be drawn, each plate having a series of longitudinally arranged ribs which project from the plate and are of a uniform or substantially uniform depth throughout their length, the ribs being so arranged that they converge towards the rear of the pleater, i.e. in the direction of travel of the material as it is drawn between the two sets of ribs, the ribs on the one plate entering the spaces between the ribs on the other plate.

2. A pleater as claimed in claim 1, wherein the depth of entry of the ribs on the one part between the spaces intermediate the ribs on the other part is progressively increased from the forward end of the pleater, i.e. the end which first receives the material to be pleated to the rearward end.

3. A pleater as claimed in claim 2, incorporating a cam, eccentric or other adjusting device for increasing the depth of entry to suit particular requirements.

4. A pleater as claimed in any of the preceding claims in combination with a heating device for heating the material during its passage through the pleater.

5. A pleater as claimed in any of the preceding claims, wherein the ribs are formed separately from the plate or other supporting member and are located in position therein or thereon in any suitable manner.

6. A pleater as claimed in any of claims 1—4, wherein the ribs are constructed integrally with their associated plate or other supporting member as, for example, by casting or by a process of electro-deposition.

7. A pleater as claimed in claim 5, wherein the ribs are formed individually and are pivotally or otherwise movably associated with their supporting plate or member.

8. A pleater as claimed in claim 7, including a multiple cam having a number of cam surfaces adapted as a result of rotational movement of said cam to be brought into engagement successively or in any other order with their associated ribs, so as to vary the number of ribs in operation at one time.

9. A pleater as claimed in any of the preceding claims, formed in two parts pivotally associated together and include a spring urged plunger or other device for urging the parts together and the ribs into operative engagement with the material drawn therethrough.

10. A pleater as claimed in any of the preceding claims, having wedge or other means for varying the angle of divergence of the ribs.

11. A pleater for the purpose specified, substantially as hereinbefore described with reference to either of the examples shown by the accompanying drawings, and subject to the modifications referred to.

Dated this 12th day of March, 1941.

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New York, U.S.A.,
Agents for the Applicants.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1941.

Fig. 1.

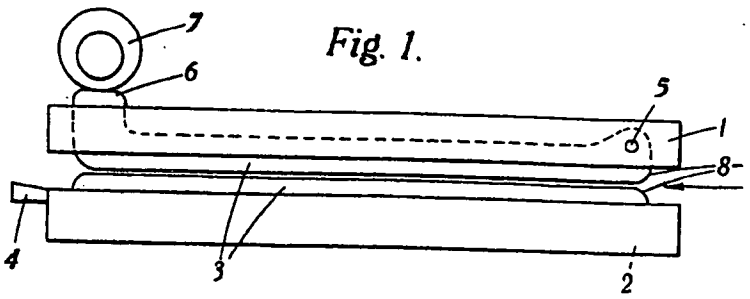


Fig. 2.

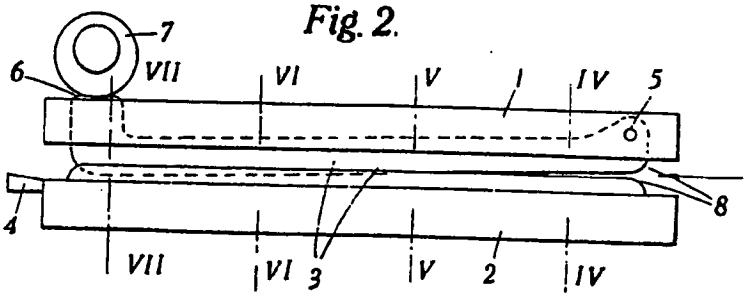


Fig. 3.

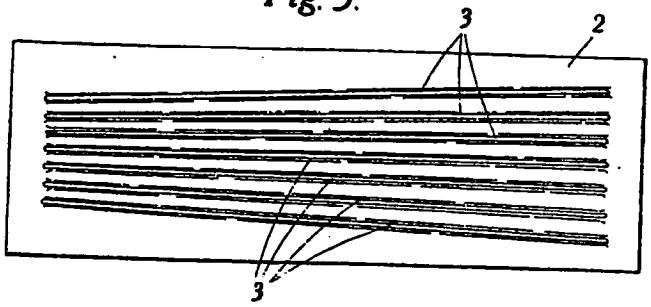


Fig. 4.

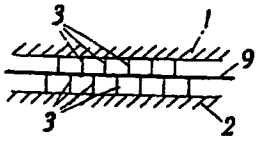


Fig. 5.

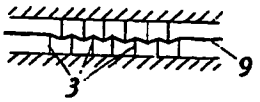


Fig. 6.

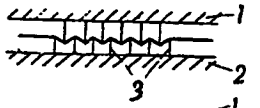


Fig. 7.

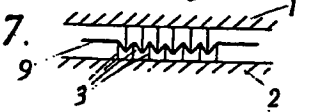


Fig. 8.

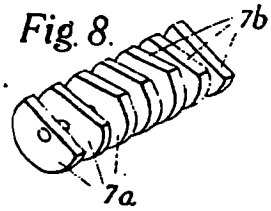


Fig. 9.

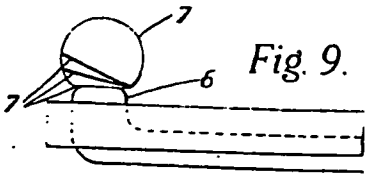


Fig. 10.

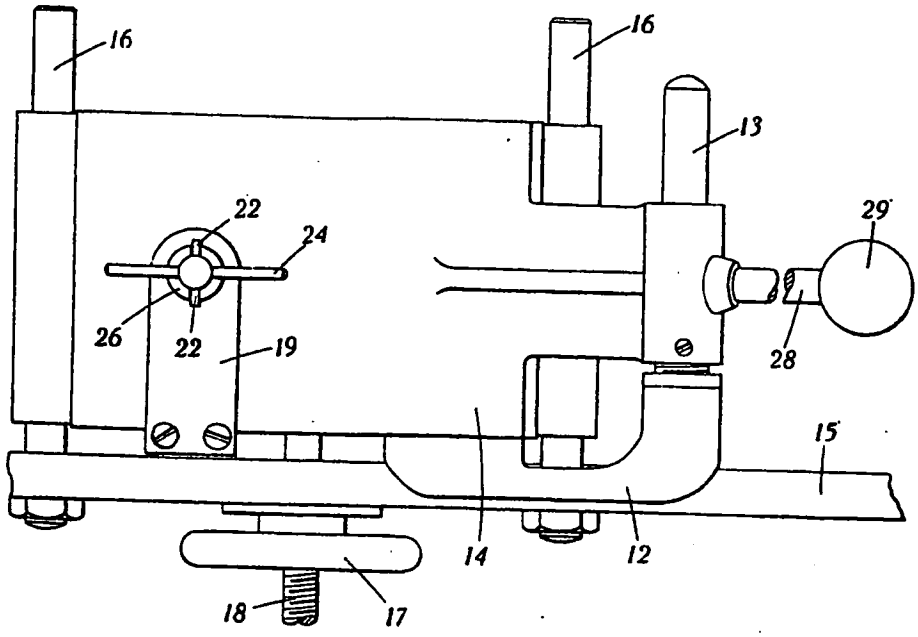
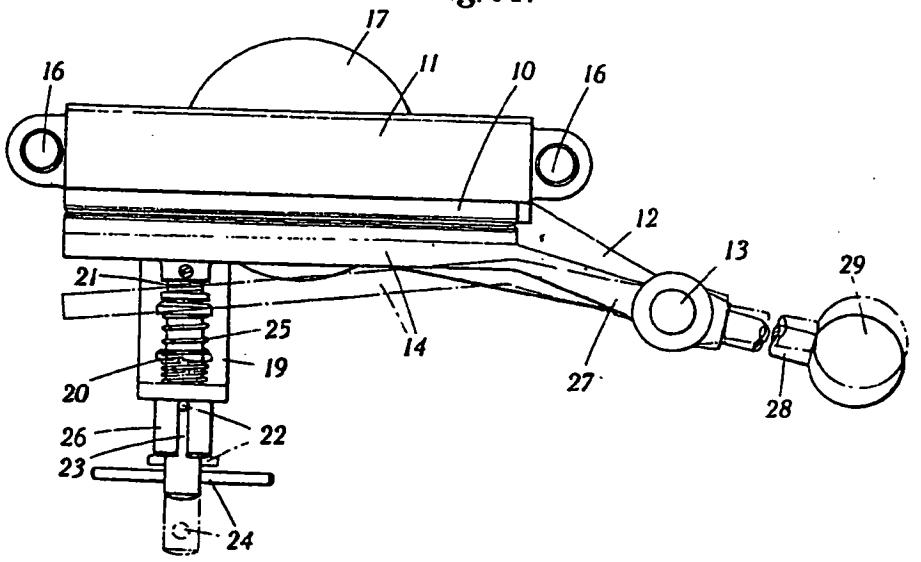


Fig. 11.



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541,015 COMPLETE SPECIFICATION

SHEET 1

2 SHEETS
SHEET 2

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

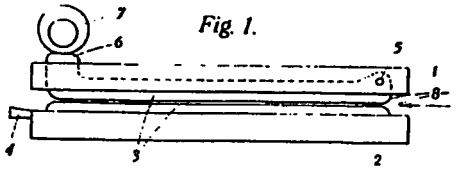


Fig. 2.

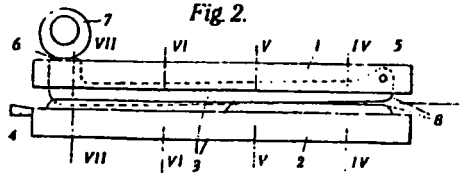


Fig. 3.

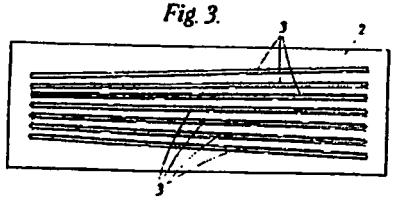


Fig. 4.

Fig. 5.

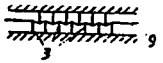


Fig. 6.

Fig. 7.

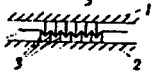


Fig. 8.

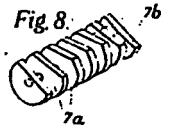


Fig. 9.

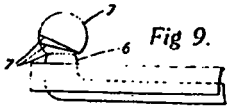


Fig. 10.

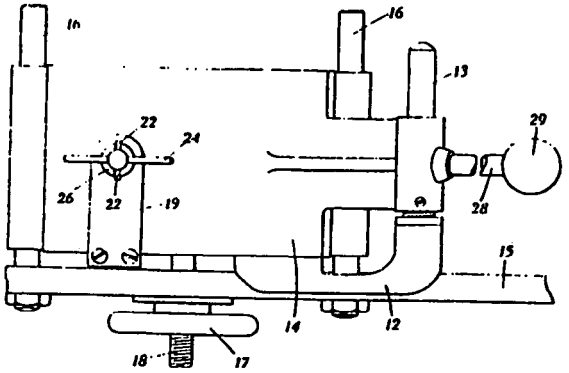
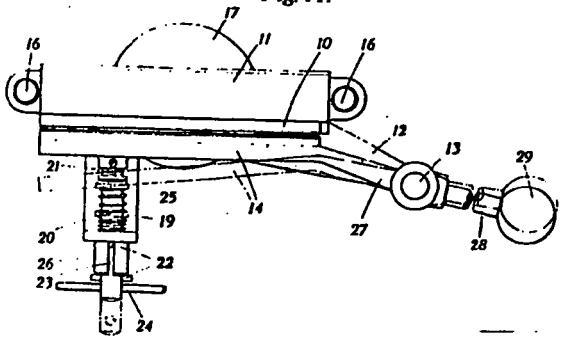


Fig. 11.



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Applicant(s)::
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EC Classification: B42C9/02, B65H45/12
Equivalents:

Abstract

Data supplied from the **esp@cenet** database - I2